

# Algorithm for Prediabetes and T2DM in Children and Adolescents

## SCREENING INDICATIONS IN ASYMPTOMATIC PATIENTS AGES < 10YO

- BMI ≥ 99thpercentile
- T2DM in 1st degree relative or Gestational DM in patient pregnancy

• Acanthosis or other sign of insulin resistance<sup>1</sup>

### **SCREENING INDICATIONS IN ASYMPTOMATIC** PATIENTS AGES ≥ 10YO

- BMI ≥ 95th percentile as a sole risk factor
- BMI ≥ 85thpercentile

#### AND at least 1 risk factor:

- First or second degree relative with T2DM
- o Identifies with high risk ethnic group<sup>1</sup>
- Maternal history of gestational diabetes during child's pregnancy
- Acanthosis or signs of insulin resistance<sup>2</sup>

## **SCREENING INDICATIONS IN** SYMPTOMATIC PATIENTS

- Excessive fatigue
- Increased urination
- Increased thirst
- Blurred vision
- Slow wound healing
- Recurrent candida infections
- Weight loss

#### Normal<sup>3</sup>

HbA1c: < 5.7%<sup>4</sup> FPG: < 100 mg/dL Random Glc: < 140 mg/dL

#### "Low Risk" Prediabetes<sup>3</sup>

HbA1C4: 5.7% to 5.9% OR FPG: ≥ 100 mg/dL and < 125

Random Glc: 140-200 mg/dL

"High Risk" Prediabetes

or "Early" Diabetes³
HbA1C⁴: 6.0% to 7% OR
FPG:≥100 mg/dL and < 125 mg/dL Random Glc: 140-200 mg/dL

Diabetes<sup>3</sup>

HbA1C⁴:>7% **OR** FPG:≥125 mg/dL **OR** Random Glc: > 200 mg/dL

- Initiate lifestyle intervention<sup>5</sup> in PCP setting, education on symptoms of diabetes
- Repeat HbA1C AND FPG in 6 months
- Initiate lifestyle intervention<sup>5</sup> and consider referral to dietitian or IDEAL clinic
- Repeat HbA1C AND FPG in 2-3 months

HbA1C 5.7-6.5% AND FPG < 100 mg/dL

HbA1C > 6.5- <7% FPG 100-125 mg/dL

HbA1C: > 7% FPG: > 126 mg/dL

# Manage in Primary Care

- Screen every 3 years if BMI is ≥ 85th to < 95th percentiles
- Screen annually if:
  - o BMI ≥ 95th percentile or BMI
  - Signs of insulin resistance
  - o Abnormal weight gain

Educate patient on symptoms of overt diabetes Consider lifestyle intervention<sup>5</sup>,

including referral to Dietitian or **IDEAL Clinic** 

# Refer patient to Diabetes Clinic

- HbA1C 6.5 7% is ok for routine referral, expedited appt not needed unless FPG >200
- Not recommended to collect 2-hr OGTT prior to any specialist or specialty clinic referrals<sup>6</sup>
- Screen blood sugar immediately if presence of diabetes symptoms
- Consider lifestyle intervention<sup>5</sup> including referral to Dietitian or **IDEAL Clinic**

# Refer patient to Diabetes Clinic for expedited appointment

- Consider lifestyle intervention<sup>5</sup> including referral to Dietician or IDEAL Clinic
- If plasma glucose > 250 mg/dL or HbA1C >9% patient requires immediate intervention.

Please collect a urinalysis for alucose and ketones and contact Diabetes team or refer to **Emergency Department** 

| # | Subject Superscript  | Description  |             |                    |   |
|---|--|--|-------------|--------------------|---|
| 1 | Signs of insulin resistance  | <ul> <li>Hypertension</li> <li>Dyslipidemia (<hdl; elevated="" hdl="" li="" non-hdl;="" ratio)<="" tg=""> <li>Acanthosis Nigricans/Skin tags</li> <li>Polycystic Ovarian Syndrome</li> </hdl;></li></ul>   |             |                    |   |
| 2 |  | Racial/ethnic groups ranked from most to least at-risk for prediabetes and diabetes due to genetic and environmental factors: • Native American (most at-risk) • African American • Hispanic • Asian American • Pacific Islander (least at-risk)   |             |                    |   |
| 3 | American Diabetes Association lab-based classifications for normal, prediabetes, and diabetes ranges |  | Normal      | Prediabetes        | Diabetes                                    |
|   |  | HA1C   | < 5.7%      | ≥ 5.7% and ≤ 6.4%  | ≥ 6.5%                                      |
|   |  | FPG  | < 100 mg/dL | ≥ 100 to 125 mg/dL | ≥ 126 mg/dL<br><b>AND</b> diabetes symptoms |
|   |  | 2-hr OGTT  | < 140 mg/dL | ≥ 140 to 199 mg/dL | ≥ 200 mg/dL                                 |
|   |  | Children with FPG values between 86-99 md/dL have 2 times the risk for developing diabetes and 3.4 times the risk for developing prediabetes as an adult regardless of weight status.  |             |                    |   |
| 4 | HA1C as a primary screening tool   | <ul> <li>AVOID screening with HA1C in the following patients: <ul> <li>HbSS, HbCC, and HbSC due to associated anemia, increased red blood cell turnover, and rigorous transfusion requirements that distort A1c reading</li> <li>Anemia due to risk of falsely high reading</li> <li>Iron deficiency due to risk of falsely high reading</li> <li>Heavy (menstrual) bleeding due to risk of a falsely low reading</li> <li>Kidney failure</li> <li>Liver failure</li> <li>Hemoglobinopathies (i.e. thalessemias)</li> </ul> </li> </ul>  |             |                    |   |
| 5 | Lifestyle<br>interventions   | <ul> <li>Nutrition: Create tailored dietary prescription with monthly follow-up</li> <li>Weight management: <ul> <li>Primary goal: weight maintenance</li> <li>Secondary goal: loss of 0.5-1 kg per month in growing patients OR 0.5-1 kg per week in post-pubertal adolescents to achieve 5% to 10% weight percentile drop OR &lt; 85th percentile for BMI</li> </ul> </li> <li>Exercise: <ul> <li>Aerobic exercise 1-hr daily (walk, run, team sports, bike, hike, etc.)</li> </ul> </li> <li>Strength exercise 3X per week <ul> <li>Body weight exercises such as push-ups, planks, sit-ups, and squats are recommended for children and adolescents</li> <li>Resistance band, light free weight, and light weight machine exercises are recommended in adolescents with proper training</li> </ul> </li> <li>Behavior: &lt;2 hours of non-academic screen time is recommended</li> </ul> |             |                    |   |
| 6 | Utility of the 2-hr<br>OGTT  | The 2-hr OGTT is not a preferred screening test due to limited feasibility, costliness and the burden it imposes on patients.  |             |                    |   |

#### Citations:

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